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TECHNICAL MANUAL
FOR
REFRIGERATOR, MODEL R10-2M-SN,
DESCRIPTION OPERATION AND
MAINTENANCE

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Cospolich Refrigerator Company Inc.
949 Industry Rd.
Kenner, LA 70062
CAGE No. 66682

TECHNICAL MANUAL

***INSTALLATION, OPERATION AND
MAINTENANCE INSTRUCTIONS***

***Refrigerator
Model: R10-2M-SN***

***Cospolich Refrigerator Co., Inc.
Kenner, LA 70062 USA
800-423-7761***

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CHAPTER 1

GENERAL INFORMATION

1.1 *Introduction*

This technical manual provides information on the installation, operation, maintenance, and inspection of this unit manufactured by **Cospolich Refrigerator Co., Inc.**, Kenner, Louisiana. A complete parts breakdown is provided.

1.2 *Scope of the Manual*

This technical manual provides sufficient information for maintenance of the equipment.

1.3 *Equipment Description*

The unit consists of the following parts:

- a. *Storage Compartment* - The insulated food storage compartment is clear storage area. Included in this area are the adjustable shelves, an interior light, and cooling coil.
- b. *Doors* - Access to the storage compartment is through hinge-mounted insulated door(s). The doors are fully "gasketed" to provide a tight seal.
- c. *Condensing Unit Compartment* - This area contains the condensing unit(s) along with the necessary controls.
- d. *Evaporator Coil* - The evaporator coil is located in the storage compartment and is responsible for distributing the cold air associated with the refrigeration system.
- e. *Cabinet* - The cabinet is the enclosure in which all of the above items are housed.

1.4 *Equipment Supplied*

The unit is shipped from the factory fully assembled except the adjustable shelving that will require positioning on the pilaster standards as needed. The complete assembly is palletized and crated to reduce the possibility of damage in shipping and storage.

TABLE 1.1 LEADING PARTICULARS

MANUFACTURER: Cospolich Refrigerator Co., Inc.
Kenner, Louisiana 70062

TYPE: Marine Refrigeration Unit
Cospolich Model:
R10-2M-SN

REFRIGERANT: 404A

PURPOSE: Storage of Chilled Food Items

**ELECTRICAL
REQUIREMENTS:** Power Supply - 115V, 1 Phase, 60 Hz

Operating Current:

6 Amps

Maximum Power Demand:

15 Amps

**DRAIN
REQUIREMENTS:** None

MISCELLANEOUS: Weight: (Approximate)

Shipping:

320 lbs.

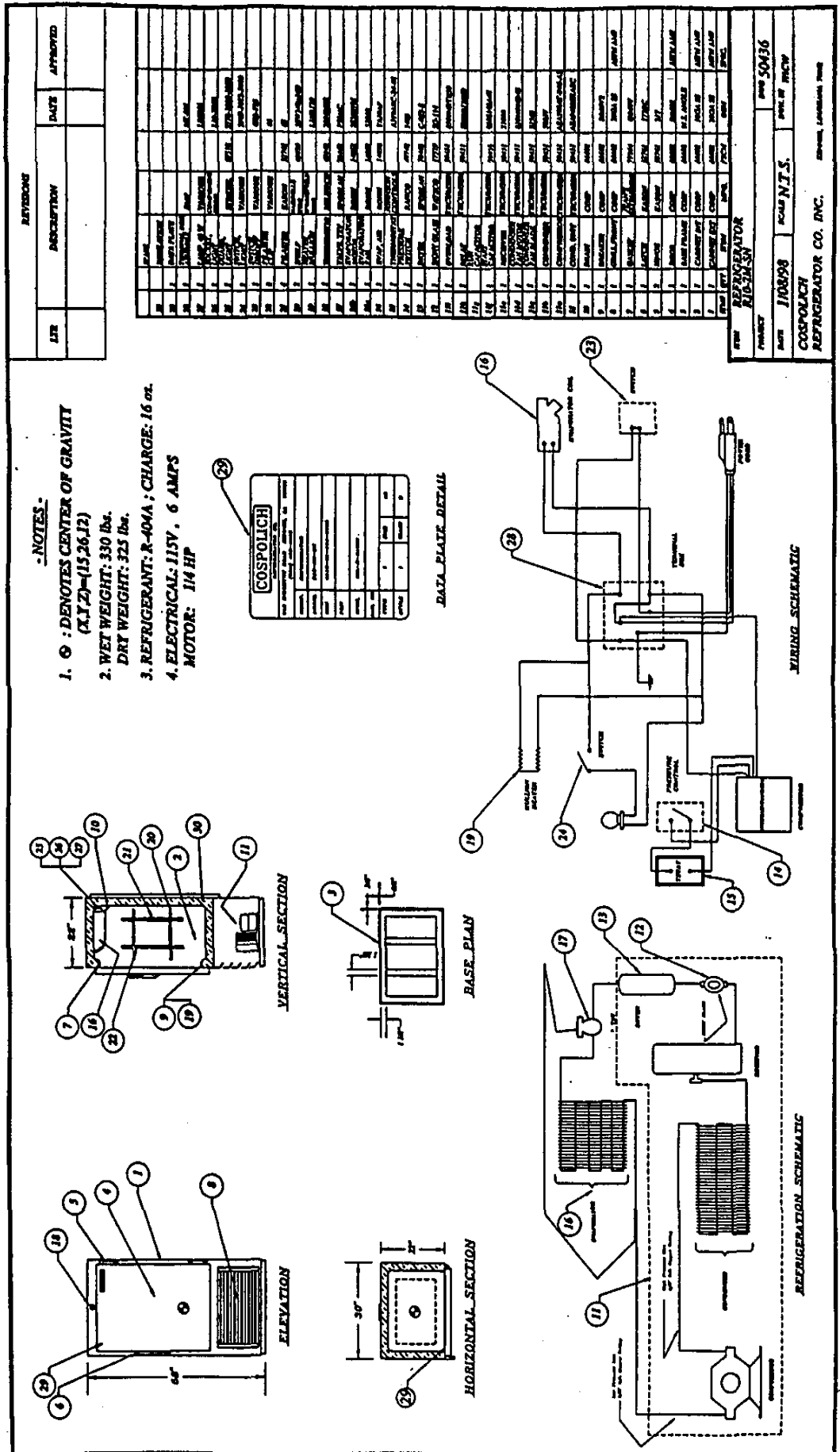
Operating:

336 lbs.

Volume:

(Crated):

30 CF



CHAPTER 2

OPERATION

2.1 Introduction

This model is a heavy duty piece of equipment designed for continuous use. It incorporates automatic controls to regulate the cycling of the refrigeration system.

2.2 Controls and Indicators

TABLE 2.1 CONTROLS AND INDICATORS

Name	Type	Function
Low Pressure Switch	Contact Points	Cycles the refrigerator system (automatic)
Suction Valve	Manual Plunger Valve	Isolate suction at the compressor
Discharge Valve	Manual Plunger Valve	Isolate discharge line at receiver
Power Control Switch (On/Off)	Contact Points	Terminates all of the electrical into and past the supply cord.
¹ Light Switch	Contact Points	Activates the interior lighting with the opening of the cabinet door
² Thermostat	Contact Points	Cycles the refrigerator System (automatic)
² Defrost Timer	Contact Points	Controls scheduled expansion coil defrosting
³ Evaporator Pressure Regulator	Needle Valve	Regulates the flow of refrigerant
³ Solenoid Valve	Automatic Plunger	Shuts off the refrigerant flow
³ Well Switch	Contact Points	Activates the solenoid to bring the cold well on line

¹Refrigerators

²Freezers

³Cold Food Counters

2.3 Start Up Procedure

The refrigeration system is completely factory-assembled, precharged, and ready for operation. To energize the system it is only necessary to find the power supply cord and connect it to a proper electrical supply source. Once the supply cord has been connected to a power source the unit can be started by flipping the power control switch to the "On" position.

TABLE 2.2 START UP PROCEDURE

Operation	Results
1. Activate system by inserting electrical service cord into electrical supply source and flip power control switch.	Compressor should immediately come on line along with the condenser fan and the evaporator fan.
2. Locate liquid refrigerant indication glass mounted on the receiver.	Once the system has been operating for two minutes, the glass should appear clear and full of liquid refrigerant.
3. Wait 15 minutes.	The temperature in the storage area should begin to approach the "green zone" indicating adequate operation.
4. Wait 3 hours.	Once the operating temperature has been reached, stocking of the containment area can begin.

2.4 Shut Down Procedure

- a. To shut down, disconnect the electrical supply cord and open the door(s) allowing the cabinet interior temperature to equalize with the room temperature.
- b. A mild detergent diluted in warm water should be used to wash down the interior and exterior surfaces of the cabinet.

TABLE 2.3 SHUT DOWN PROCEDURE

Operation	Results
1. De-energize the system by flipping the power control switch "Off" and disconnecting the electrical supply cord.	Once the system is de-energized the condenser fan, and the evaporator fan will cease operation.

WARNING:

PRIOR TO ANY CLEANING OF THE SYSTEM INVOLVING PLACING OF HANDS IN AREAS WITH MOVING PARTS, THE SYSTEM SHOULD BE DEACTIVATED BY DISCONNECTING THE POWER SUPPLY CORD.

2.5 *Preparation for an Extended Period of Inactivity*

This unit is designed for continued use at automatically cycled intervals. In case of an extended shut down, both the mechanical refrigeration system and the food storage compartment must be serviced.

TABLE 2.4 SHUT DOWN PROCEDURES FOR EXTENDED PERIOD

Operation	Results
1. Fully close discharge valve at the receiver.	Compressor will pump liquid refrigerant from system to receiver.
2. Fully close suction valve at the compressor.	This will isolate the refrigerant between the two valves.
3. Disconnect power supply.	De-energizes system.
4. Clean and wipe dry the food storage compartment.	This will reduce the odor buildup during shut down.

CHAPTER 3

FUNCTIONAL DESCRIPTION

3.1 *System Description*

This unit is a self contained, automatically controlled, continuous duty perishable food storage system. It is designed with the intent and purpose of storing food items.

The operating temperature is automatically monitored by controls that are factory set to maintain a predetermined adequate condition.

The equipment is installed in two basic compartment assemblies. They are:

- a. *Condensing Unit Compartment* - This area contains the condensing unit along with the necessary controls.
- b. *Storage Compartment* - This insulated food storage area is clear storage area. Included in this compartment is the adjustable shelving.
- c. *Cold Food Well¹* - The insulated and refrigerated compartment is designed to accommodate standard cold food pans on the top side of the counter.

3.2 *System Operation*

The design of the refrigerated cabinet focuses primarily on the safe storage of food products requiring refrigeration. In its engineering, considerable attention was placed on its functional and its serviceable capabilities.

The refrigeration system is a closed loop system. Barring a leak in the system, the adding of refrigerant is not required, however, a periodic check of its level is called for to insure that the system operates at the optimum level at which it was designed.

The condensing unit is found within the regular equipment compartment. Also, in this compartment is the electrical control panel that contains the power switch and a terminal box. On all models that feature air evaporators, a heated condensation evaporator is provided, which is also in this compartment. On remote applications, the condensate evaporator is optional.

¹Cold Food Counters

Special care in the initial loading of the storage compartment should be taken. It is suggested that the loading be scheduled in three equal portions allowing three hours between each loading.

The chilled food compartment is designed for the storage of perishable food items that require a temperature range of 37 to 40 degrees F on refrigerators and 0 to -5 degrees on freezers. It is a general rule that adequate spacing be allowed storage items to allow proper air circulation.

CHAPTER 4

SCHEDULED MAINTENANCE

4.1 *Introduction*

To insure the longest and most trouble free operation, a thorough periodic maintenance schedule is required. The maintenance system should be aimed at maximizing the efficient use of maintenance personnel, reducing down time, and providing the orderly acquisition of spare parts support.

The **Cospolich** refrigeration cabinet will generally be operated where scheduled maintenance is performed according to Maintenance Index Plans. This chapter of the manual is intended as an alternate to any standard maintenance program that may exist. The preventive maintenance schedule is based upon similar maintenance requirements for commercial refrigeration equipment.

4.2 *Preventive Maintenance Action Index*

If there is not a maintenance index plan, we have formulated our schedule for periodic maintenance in Table 4.1.

4.3 *Preparation for Maintenance*

Since many areas affected in the maintenance schedule are electrically supplied, it may be necessary to de-energize the system when making these inspections.

4.4 *Maintenance*

4.4.1 *Weekly Inspection*

- a. The unit should first be de-energized by switching the toggle switch that is found on the control panel in the condensing unit compartment to the "Off" position.

Note: It is necessary to first remove the front air grill by lifting it straight up, then moving the bottom out and down.

- b. Using a vacuum or small hand broom, brush the condenser coil in a vertical motion to remove any dust or debris that may have accumulated.

4.4.2 Monthly Inspection

- a. Check the drain line at both the inlet and outlet ends to make certain that there are no obstructions. It is not recommended to use any chemicals in clearing a clogged drain. The preferred method of unstopping an obstructed drain is to use 60 lbs. of compressed air. (Forced air evaporator models only.)

1. Simply remove the drain line at the evaporator coil and attach an air line to it.
- b. With the unit in a cooling cycle, use a flashlight and find the liquid refrigerant sight glass. If the compressor has been running low for three minutes, there should not be any visible bubbles.
 1. If there should be a presence of bubbles, it will be necessary to determine if there is a refrigerant leak, find it and repair it.
 2. Using a halide or electronic leak detector, check all fittings and connections for a leak.

WARNING: The system should be de-energized when it is being checked for leaks.

3. Should a leak be found on a flared fitting, often it can be repaired by simply tightening the brass flare nut a quarter of a turn. If this does not resolve the problem, it may be necessary to reflate the tubing.
4. If a leak is found on a brazed joint, it will be necessary to pump down the system's refrigerant charge to remedy the problem.
5. To pump the refrigerant into the receiver, you must first connect service gauges to the system at the suction valve (on compressor) and liquid valve (on the receiver.) Purge the gauges before opening the system's valves to avoid contamination. Run the receiver (liquid or high pressure) valve all of the way in to stop refrigerant from exiting the receiver. Start the unit and allow it to run until the suction or low pressure gauge reads 5 lbs. When it does, de-energize the system.
6. At this point, the necessary repairs can be made to mend the leaks.
- c. Using a mild non-abrasive detergent and soft cloth, wipe the interior liner beginning with the top and working down. Also, wipe the gasket, and where it sits on the cabinet exterior.

- d. With the front air grill removed, unbolt the condensing unit and slide it out. With the unit off, check the fan motor and make certain it is not loose. Inspect the fan for cracks and make sure it is tight on the motor.
 - 1. To inspect the evaporator motor, first turn the unit off. Then, remove the drain line from the evaporator pan, then loosen the four screws that hold this shroud. Lower the shroud and disconnect the polarized electrical connection. With the shroud out of the cabinet, proceed to inspect the motor mounting bolts and the fan, for cracks or excessive play (on forced air systems.)
- e. Using a mild detergent and water, wipe the vinyl gasket. Make certain also to clean under the gasket to remove any mildew or residue.
- f. Using a mild detergent (non-abrasive) and warm water, wipe the cabinet exterior. When cleaning, always follow the grain of the stainless steel so as not to scratch or mar the finish.

4.4.3 Annual Maintenance

- a. Slide condensing unit out of the compartment and check all of the refrigerant lines for leaks or fatigue. Make certain that no exposed copper tubing is in contact with any other metal surface. If the case exists, install an insulating material between the two metal components.
- b. With the condensing unit out and the breaker at the main electrical panel "**Off**," inspect the system's wiring. Look for a tight fit of all connections and make certain that the wire restraining devices are tight. Inspect all wires and cords, paying particular attention to nicks or aging cracks in the insulation.
- c. Visually, inspect the outer panel and components of the cabinet. Check screws and bolts to make certain they are tight. Check the bolts that secure the base frame to the deck to make certain they are tight.

4.4.4 Three Year Frequency

- a. Replace the door gaskets. To accomplish this, it is first necessary to remove all of the products from the compartment. Take the door off the cabinet and lay it on a flat surface. Lift the gasket flange and remove the fasteners that secure the gasket. The new gasket is replaced by reversing the process.
- b. Inspect all motors and shafts for both noise and wear. If they should show age, replace them.
- c. With the main power off, remove the condensing unit from its compartment and inspect all wiring. Also, remove the cover from the controls and check them to make certain they are operational and do not show signs of wear.
- d. Inspect the operation of the door latch assembly. Look into the latch to make certain that the moving parts do not show any signs of wear. Check to make sure that the screws are tight on the latch and strike. To check the hinges, open the door at a 90-degree angle to the cabinet. With a little pressure, lift up the outer edge of the door. If there is an upward movement of $\frac{1}{2}$ inch, replace the hinges.
- e. To recalibrate the thermometer, remove it from the cabinet. Using a small flat screwdriver, remove the lens. Prepare an ice water bath and submerge the bulb, continually moving it. The indicator dial should read 32 degrees F. If it does not, the thermometer can be calibrated by placing your index finger on the opposite side of the needle that it needs to move. Using a flat screwdriver, turn the screw at the center of the dial $\frac{1}{4}$ turn in the direction you want to move the dial. Repeat the procedure until you reach the desired temperature. (See illustration.)

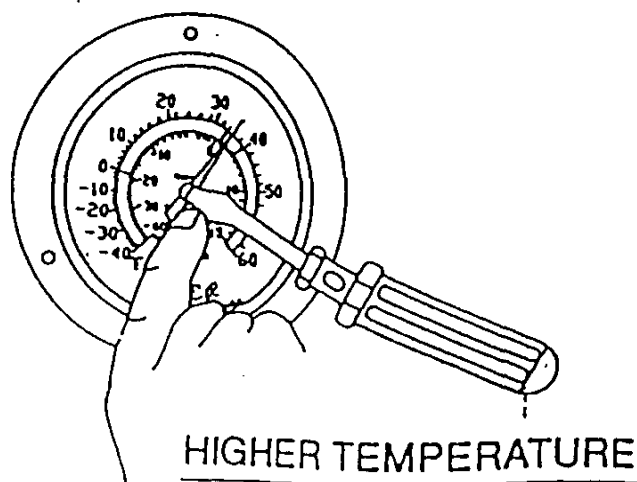
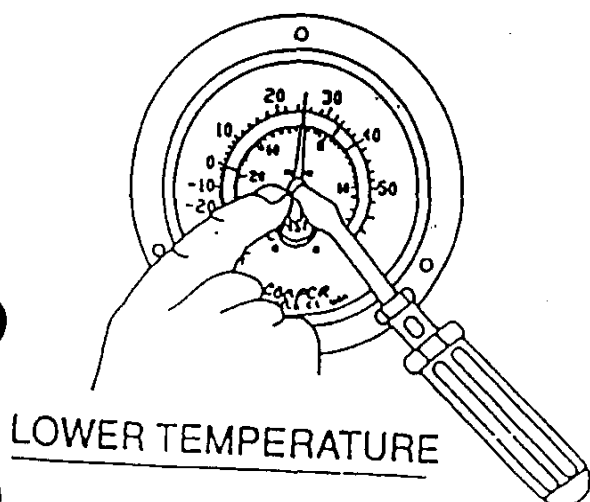


TABLE 4.1 PREVENTIVE MAINTENANCE ACTION INDEX

Item	Frequency	Description
1.	Weekly	<ul style="list-style-type: none"> a. Inspect condenser coil to make certain that air flow is not hampered and that it is clear of dust and debris.
2.	Monthly	<ul style="list-style-type: none"> a. Inspect and clear drain line. b. Check the liquid refrigerant sight glass to make certain that the system is fully charged. c. Wipe down the interior liner with a mild soap and warm water solution. Be certain to dry thoroughly. d. Check both the condenser fan motor and the evaporator motor to make certain that they are operational and that the fans are tight and secure. (Evaporator motor on ADS models and forced air evaporator units only) e. Wipe door gaskets and breaker strips with a damp cloth. f. Clean exterior with mild soap and warm water and dry thoroughly.
3.	Annually	<ul style="list-style-type: none"> a. Slide condensing unit from compartment and check all joints and fittings for any signs of leaks or fatigue. b. Inspect electrical connection to make certain that there is a good contact and that wires are neither weakened or worn. c. Check the integrity of the cabinet.
4.	Three-Year Frequency	<ul style="list-style-type: none"> a. Replace door gaskets. b. Inspect motor shafts for noise or wear. c. Inspect electrical controls and wiring. d. Inspect latch and hinges. e. Recalibrate thermometer.

CHAPTER 5

TROUBLESHOOTING

This chapter will help in a systematic check of components in determining any cause of equipment failure.

It will be necessary that the individual involved in the troubleshooting operation be familiar with the function of the equipment as described in Chapter 3.

The following table lists the most common symptoms that may be experienced and the recommended corrective action. The tables are separated into electrical maintenance, mechanical maintenance, and operators' actions.

TABLE 5.1 MECHANICAL AND ELECTRICAL TROUBLESHOOTING GUIDE

Symptom	Possible Failure	Remedy
Unit does not operate	1. Control failure 2. Incorrect voltage 3. Failed compressor	Adjust control or replace Correct Replace
Unit runs continuously	1. Low on refrigerant 2. Control failure 3. Bad connection at TXV 4. Restricted air flow or dirty 5. Bad condenser fan motor 6. Expansion valve stuck open 7. Compressor failure 8. Ineffective door seal 9. Circulation in storage restricted	Leak check system and recharge. Adjust control or replace Check and secure sensor bulb to suction line Rectify air flow problem and clean condenser. Check and replace if necessary Replace Replace Adjust door strike Redistribute food for even air flow

TABLE 5.1 MECHANICAL AND ELECTRICAL TROUBLESHOOTING GUIDE
(Continued)

Symptom	Possible Failure	Remedy
Low head pressure	1. Defective compressor	Replace
	2. Low refrigerant	Leak check system and recharge
	3. Ambient temperature too low	Raise room temperature
High head pressure	1. Blocked or dirty condenser	Clean and remove any obstructions
	2. Ambient temperature too high	Improve room temperature
	3. System contains air	Evacuate, change the filter dryer, and recharge
	4. Refrigerant overcharge	Reduce refrigerant in the system
Short cycling	Maladjusted control	Adjust control

TABLE 5.2 OPERATORS' TROUBLESHOOTING GUIDE

Symptom	Possible Failure	Remedy
Unit does not cool	1. Blown fuse	Replace fuse
	2. Bad connection at supply cord	Check supply cord at outlet
	3. Ill fitting gasket	Tighten strike on door latch

CHAPTER 6

CORRECTIVE MAINTENANCE

6.1 *Introduction*

This chapter focuses on the instruction needed in the removal and replacement of certain components. We will also address the repair of components not listed under the schedule maintenance index covered in Chapter 4.

The components that we address are considered acceptable for repair using standard procedures that we will detail. The level of skills required to perform the service or repair will vary. Some may require specific training. It is up to the individual and/or his supervisor to determine their capability to undertake the particular task of service or repair.

It is also important to know that any procedure requiring the handling of refrigerant requires certification.

The service or repair items are limited to those listed in Chapter 7.

6.2 *Repair Procedures*

*****WARNING*****

PRIOR TO PERFORMING ANY WORK ON THE REFRIGERATION SYSTEM, IT IS REQUIRED THAT THE UNIT BE DE-ENERGIZED.

6.2.1 *Replacement of Motor Compressor*

- a. Before beginning the change out of the compressor, it is first necessary to disconnect electrical power to the unit. This should be done by turning off the circuit in the main supply panel. It should be noted on the panel that the refrigerator is being serviced and the breaker must remain off.
- b. To reach the condensing unit, you must first remove the ventilation grill on the front of the cabinet. This is accomplished by lifting the grill vertically one inch, pulling out the bottom, and lowering the grill from the retainer angles.
- c. With the grill removed, use a 3/8" wrench or socket and ratchet to unscrew the mounting bolt that secures the condensing unit to the cabinet base.
- d. Once the mounting bolt is removed, carefully slide the whole condensing unit forward, lifting it over the angle-mounting clip at the front of the base. The unit can be pulled completely out of the unit compartment and placed on the deck.
- e. Find the electrical terminal box on the side of the compressor and remove the front cover. Disconnect the wires from the compressor. Remove the screws which attach the terminal box to the compressor. At this point, the compressor will be electrically detached.

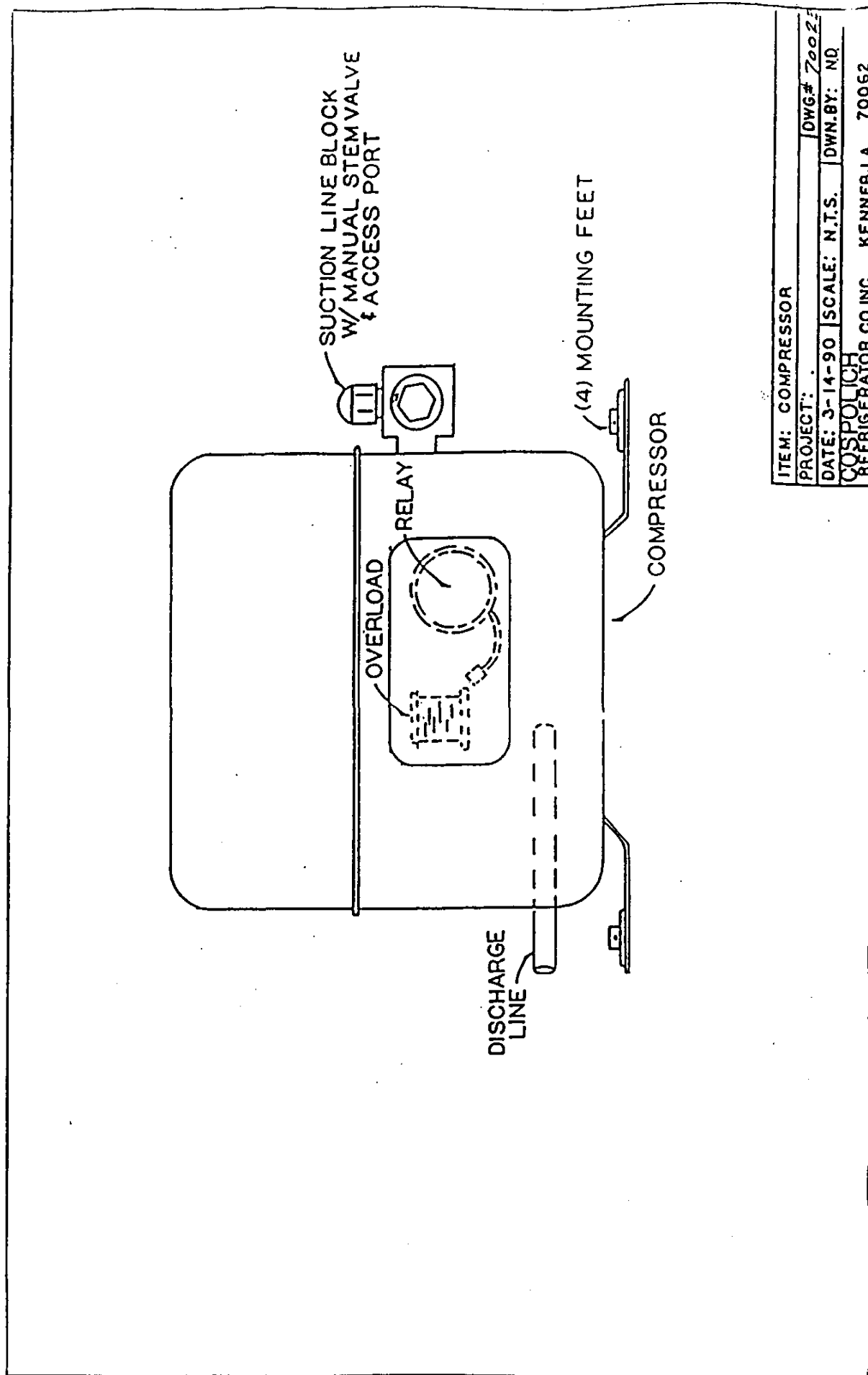


Figure 6.1

WARNING: *DO NOT APPLY FLAME TO A LINE WITH REFRIGERANT IN IT.*

- f. Using wrenches, remove the suction valve stem cover caps on each side of the compressor. Also, remove the cap nut on the suction side.

Note: Federal laws require proper handling and disposal of refrigerants.

- g. Disconnect the hi-side line at the compressor. This is done by heating the brazed connection using an acetylene and oxygen torch set.

WARNING: IT IS UNLAWFUL TO VENT ANY REFRIGERANT INTO THE ATMOSPHERE.

- h. To remove the low pressure control capillary tube and service fitting, loosen the 1/4" brass flare nut on the suction valve.
- i. The final step in removing the compressor will be disconnecting it from its mounting. To accomplish this, remove the wire clips on each of the four feet. This will free the compressor.
- j. To install the new compressor, place it in position on the base and reinstall the four wire clips.
- k. Reattach the suction and discharge valve blocks to the appropriate sides of the compressor.
- l. Reattach the low pressure control capillary tube and service fitting to the suction
- m. Reattach the suction line to the compressor.
- n. In reconnecting the hi-pressure line, it will be necessary to first prepare the line end. Using a fine sand paper or emery cloth, clean the residue on the end. Also, clean the connection on the compressor. Apply flux to both ends and braze.
- o. Remove the valve stem cap from the suction valve block on the side of the compressor. Run the valve stem all of the way out and then in one turn clockwise.
- p. Place the refrigeration service manifold gauge hoses on the suction and hi-side valves. Attach a bottle of refrigerant to the charging hose and charge the system with 150 psi of vapor. Using an electronic leak detector, check the new connects for leaks. Should a leak appear, release the charge and repair the leak. Repeat the leak check process again.

- q. If the system checks out with no leaks, recover the test charge.
- r. With the system pressure at zero, connect the vacuum pump and evacuate the system. The pump should run for one hour. The vacuum pump should pull the system down to 30 inches of vacuum.
- s. Reattach the electrical terminal box and secure all wiring.
- t. Check the refrigeration tag on the unit for number of ounces of refrigerant to place into the system for start up. Monitor the pressure on both the suction and discharge side of the manifold gauges. Check the temperature as it begins to fall through the sight glass on the receiver. Once the unit has been running for five minutes and bubbles continue in the sight glass, adding additional refrigerant may be necessary (add refrigerant in small amounts to keep from overcharging.)

*****WARNING*** OVERCHARGING A REFRIGERATION SYSTEM CAN BE DANGEROUS**

If the system refrigerant overcharge is sufficient to immerse the major parts of a hermetic compressor in liquid refrigerant, a situation has been created which when followed by unusual but possible circumstances, can lead to compressor housing seam separation or rupture.

The sequence of circumstances that can lead to compressor housing seam separation or rupture occurs in the following manner:

1. The system overcharge immerses the compressor motor, the piston, connecting rods, cylinders, etc., in liquid refrigerant, thereby effectively forming a hydraulic block preventing the compressor from starting. This condition is known as locked rotor.
2. Electrical current continues to flow through the compressor motor windings that become, in effect, electric resistance heaters. The heat produced begins to vaporize the excessive liquid overcharge, causing a rapid increase in system pressure.
3. If the system compressor protective devices fail for any reason prior or during this locked rotor heating cycle, or cycles, liquid refrigerant may be vaporized sufficiently fast enough to raise the pressure within the system to extremes far greater than the housing or weld seam design limits.

4. In some instances where the amount of refrigerant overcharge is critical in proportion to the system internal volume, the pressure reached can cause a compressor housing seam separation or rupture which can be hazardous.

The remedy to eliminate this exceedingly rare, but potential hazard is to use correct refrigerant charging amounts and techniques.

Cospolich Refrigerator Co., Inc. urges that all individuals responsible for training, teaching or advising installation mechanics and service personnel, emphasize proper charging techniques and strict adherence to limiting refrigerant charge amounts to those specifically recommended by the manufacturer of the refrigeration, air conditioning, or heat pump system.

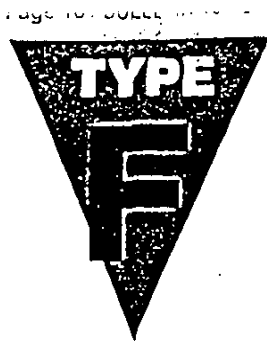
6.2.2 Replacement of Low Pressure Control

- a. Disconnect unit from electrical service.
- b. Remove control cover and disconnect electrical terminals.
- c. Disconnect capillary tube.
- d. Remove mounting fasteners on control base and install new control by reversing the procedure.

Note: The cabinet temperature (37 - 40 degrees for the refrigerator and -5 - 0 degrees for the freezer) is regulated by system pressure rather than actual cabinet compartment temperature.

- e. To adjust the control, hook up the service manifold to the suction and discharge valves and crack them to allow the gauges to read.
- f. Coarse adjust the control by using a standard screwdriver by turning the adjustment screws on the top of the control. Preset the cut in and cut out at 68 lbs. and 38 lbs. respectively for the refrigerator and 25 lbs. and 10 lbs. respectively for the freezer.
- g. Start the system up. Allow it to run for five minutes. Monitor the low side pressure. Fine adjustments will be required to achieve the required cycling pressures.

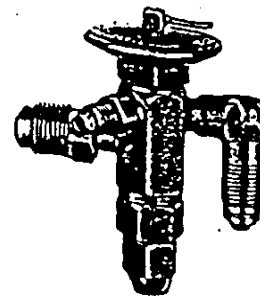
Note: The control adjustment process can be speeded up by running the suction valve in or out as required effectively to change the pressures.



for Refrigerants 12-22-502 — SAE Flare & ODF Solder Connections

Sporlan Type F valve is a small brass bar body, externally adjustable valve available with either SAE flare or ODF solder connections. The thermostatic element is replaceable, and the SAE flare inlet connection has a removable 100 mesh strainer. This valve is designed for small refrigeration systems such as refrigerated cases, coolers, and freezers where space is limited but an external adjustment is desired.

Refrigerant distributors which will mate directly to this valve are listed below. Refer to Sporlan Bulletin 20-10 for additional application information on this subject.



OUTLET CONNECTIONS

1/2" SAE

1/2" ODF

DISTRIBUTORS

1603, 1605, 1606, 1608, 1650(R)

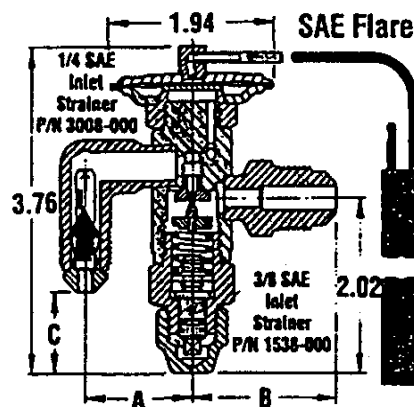
1613, 1616

for complete details of construction, see page 32

SPECIFICATIONS

ELEMENT SIZE No. 83, KNIFE EDGE JOINT

Refrigerant	Internal Equalizer	Nominal Capacity Tons of Refrigeration	Thermostatic Charges Available	Connections
404A	FS1/4	1/4	Z	1/2 only



DIMENSIONS — Inches SAE

Outlet Fitting Size	1/4" A	3/8" B	1/2" C
1/4" Elbow	1.05	1.34	1.34

Figure 6.3

6.2.3 Replacement of Expansion Valve

- a. Shut liquid valve and run compressor until it pumps refrigerant into receiver (low side service gauge will read 0 pounds). Close the suction line valve.
- b. Disconnect the sensor bulb on the suction line.
- c. Disconnect liquid line (1/4") and suction line (3/8"), then remove valve.
- d. Install new valve, reconnect lines and refasten sensor bulb.

Note: It is not recommended to adjust the valve super heat as this comes preset from the factory.

6.2.4 Replacement of Filter Dryer

- a. Close liquid line valve and run compressor until the low side refrigeration gauge indicates 0 pounds, then close suction.
- b. Remove filter dryer from system and replace with new dryer.
- c. Purge system and add refrigerant if needed.

6.2.5 Replacement of Condenser Fan Motor

- a. Disconnect all electrical power to the unit.
- b. Remove the condensing unit from the condensing unit compartment.
- c. Remove the protective wire shroud.
- d. Disconnect the fan motor leads from the terminal box on the compressor.
- e. Remove the mounting screws at the motor base.
- f. Using an allen wrench, remove the aluminum fan.
- g. To install the new motor, reverse the process.

6.2.6 Replacement of Condenser Fan

- a. Disconnect all electrical power to the unit.
- b. Remove the front grill by lifting vertically pulling the bottom slightly and dropping down.
- c. Remove the mounting bolts on the condensing unit base and slide the refrigeration assembly out.
- d. Remove the protective shroud from around the motor.
- e. Using an allen wrench, loosen the set screw on the blade hub and slide blade from the shaft.
- f. Reverse procedure to reassemble.

6.2.7 Replacement of Anti-Condensate Heater

Note: The anti-condensate heater is found behind the front edge of the vinyl door opening breakers.

- a. Disconnect all electrical power supply to cabinet.
- b. Remove breakers by exerting pressure at the front edge toward the center of the door. Disconnect anti-condensate wiring connection under rail
- c. Remove anti-condensate heater from recess in rail.
- d. Replace heater in rail and reconnect electrical.

6.2.8 Replacement of Door Handle

Note: Removing the handle assembly in order may be necessary to get the cabinet through a door opening.

- a. Remove the three side mounting screws in latch.
- b. Remove two screws in strike.
- c. Replace in reverse order.

6.2.9 Replacement of Door Gasket

Note: It is suggested that the door be removed from the cabinet and placed face down on a work table.

- a. Remove the fasteners and pull old gasket off retainer.
- b. Clean gasket retainer and immediate area.
- c. Start new gasket into retainer. After gasket is positioned, replace fasteners.

Note: Avoid cutting the gasket if possible.

6.2.10 Replacement of Door Hinge

Note: This procedure will require two people. One to hold the door while the other person removes the attachment screws.

- a. Using a screwdriver, remove the three screws which attach the butt section of the hinges to the cabinet.
- b. With the door detached from the cabinet, remove the screws which attach the second part of the hinge to the door.
- c. To install the replacement hinge, reverse the process.

6.2.11 Replacement of Power Switch

- a. First shut off all electrical power going to the unit and tag the switch so that it cannot be accidentally turned on.
- b. Remove the front air grill.
- c. Using a flat blade screwdriver, remove the cover plate with switch attached.
- d. Remove the wires connected to the switch.
- e. Unscrew the lock washer and remove the switch.
- f. Reverse the processing when installing the new switch.

6.2.12 Replacement of Drain Line

Note: To replace the vinyl drain line, it is necessary that there be access to the rear of the cabinet.

- a. First remove the rear tubing cover using a 1/4" nut driver.
- b. From the inside, pull the drain from the evaporator shroud fitting.
- c. From the rear, pull the drain through the penetration in the cabinet.
- d. At the bottom of the condensing unit compartment, cut the drain line retaining strap.
- e. The drain line should now be free.
- f. To install the new line, reverse the process.

6.2.13 Replacement of Shelf Standards

- a. To replace a shelf standard, you must first remove all products from the shelves and then remove the shelves.
- b. With the shelves removed, move the standard vertically 1/2" to allow it to slip out to the retainer stud.

6.2.14 Replacement of Lamp Socket (Refrigerators only)

- a. Should the interior lamp socket be defective, the replacement of it is necessary.

WARNING: IT IS NECESSARY TO SHUT OFF THE CABINET TO PERFORM THIS REPAIR.

- b. With the power off, remove the lamp shield by unscrewing the two #8 screws.
- c. Unscrew the light bulb and remove.
- d. To remove the porcelain fixture will require depressing the two metal retainer clips located on the outer edge of the base of the fixture.
- e. Once the fixture is out, use a screwdriver to remove the terminal wires.
- f. Reinstallation can be accomplished by reversing the process.

6.2.15 Replacement of Lamp Shield (Refrigerator Only)

- a. This change can be undertaken by loosening the two #8 screws with a 1/4" driver.
- b. Once loosened, rotate the shield to the large openings on the shield flange.
- c. Reinstallation is a reversal of the process.

6.2.16 Replacement of Light Switch (Refrigerator Only)

WARNING: ALL ELECTRICAL POWER TO THE CABINET MUST BE TURNED OFF AND THE BREAKER MARKED TO READ THAT SERVICE IS IN PROGRESS ON THAT CIRCUIT.

- a. Using a thin blade screwdriver, apply twisting pressure between the chrome cap on the switch and the unit. With this action, the switch will pop out.
- b. Pull the switch away from the cabinet about 2 inches, exposing the wires.
- c. Remove the connectors from the switch.
- d. Fasten the spare connectors to the new switch.
- e. Place the new switch into the opening and apply inward pressure with your thumbs to the chrome flange.
- f. Test the switch to make certain it is operational.

6.3 Charging Refrigeration System

- a. Connect service gauges to the suction and discharge service valves, then open valves one full turn.
- b. If the system is pressurized slightly, open both manifold gauge valves and purge the service gauge lines.
- c. With manifold gauge valves closed, start refrigeration system.
- d. Attach a drum of refrigerant to the suction service side of the manifold gauges and add refrigerant until the liquid sight glass is clear of bubbles.

6.4 *Recalibrating Thermometer*

- a. Prepare an ice bath in a small container.
- b. Remove the plastic lens cover on the thermometer.
- c. Remove the sensor element from its location on the interior of the cabinet .
- d. Place the sensor into the ice bath and stir. The thermometer should read 32 degrees F.
- e. To lower temperature - place left index finger at the left side of the wide end of pointer, but close to the bulb. Insert screwdriver in pointer slot and turn slowly clockwise. Adjust to proper setting.
- f. To raise temperature - place left index finger at the wide end of pointer, but close to the bulb. Insert screwdriver in pointer slot and turn slowly counterclockwise. Adjust to proper setting.

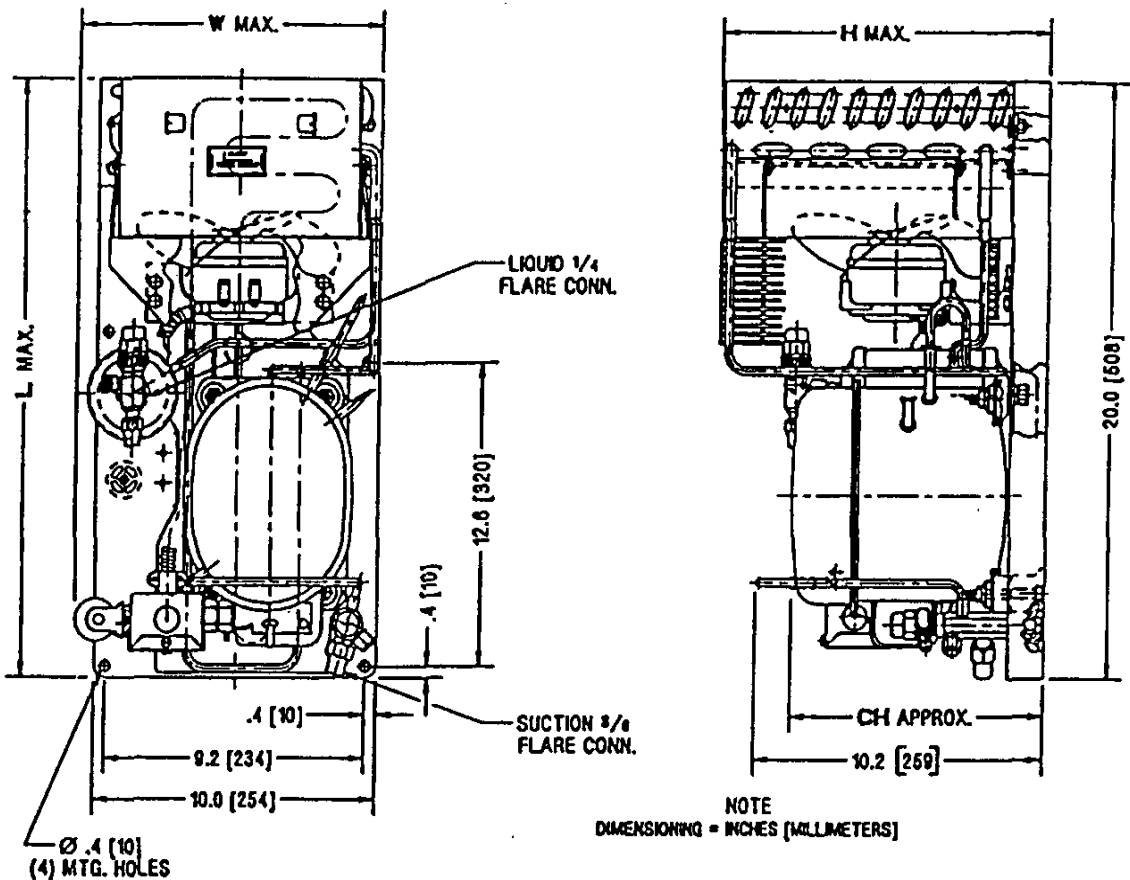
See illustration on page 4-4.



TECUMSEH HERMETIC CONDENSATE EVAPORATIVE CONDENSING UNITS

Date: 9-12-

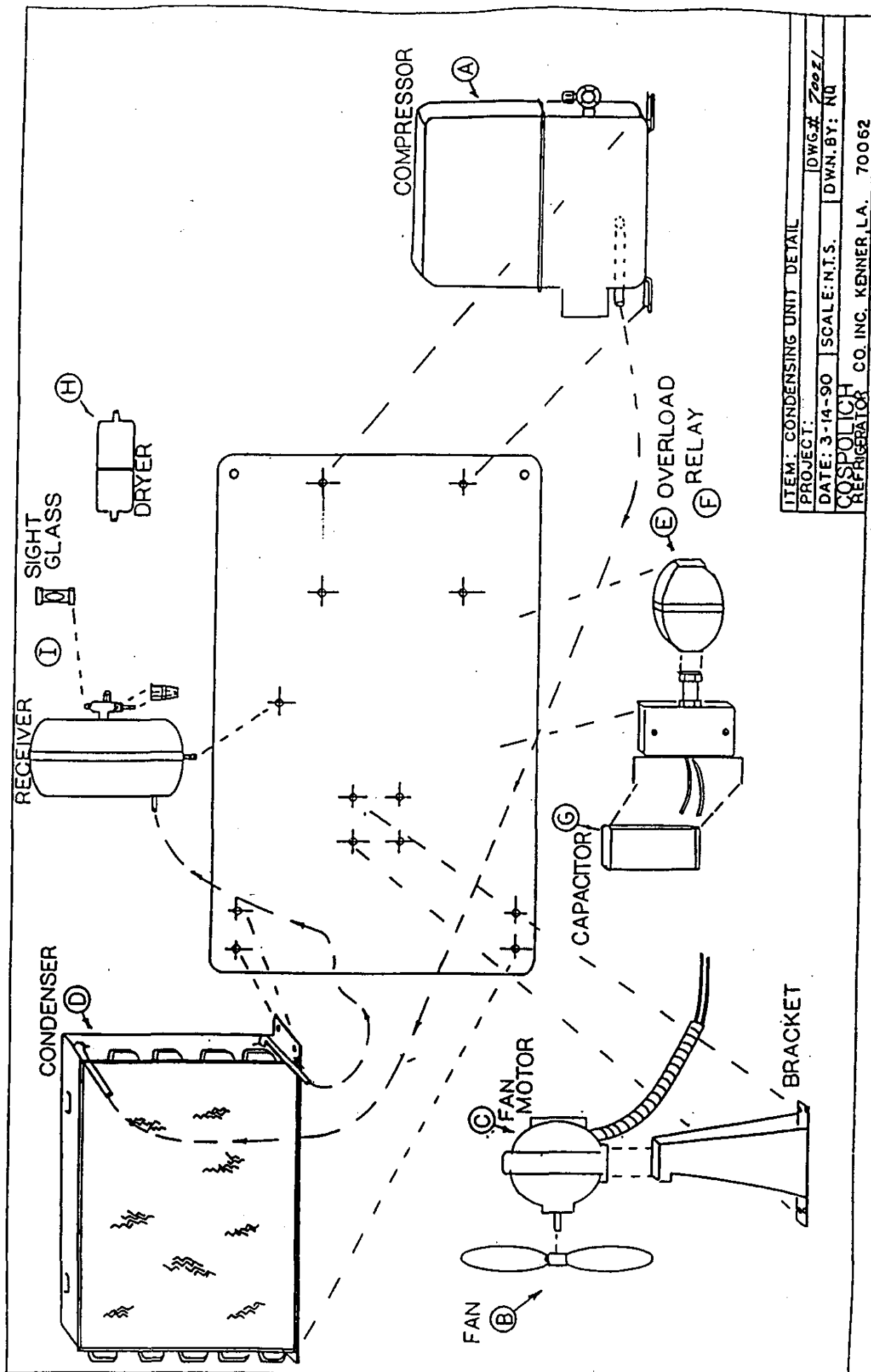
MODEL AEA9422ZXAEC (Formerly EE9422ZC) R-404A 1/3 HP AIR COOLED



Model	Dimensions				*Line Connection		Pumpdown 90 ° F 90% Full	Air CFM	Oil Chg oz.	Gr. Wt. Lbs.
	L	W	H	CH	Suct.	Liq.				
AEA9422ZXAEC	20.0	10.7	11.5	8.9	3/8 S	¼ F	2.5	280	10	99
*F=Flare, S=Solder, RF or RS= Rotolock Valve with Flare or Solder Connections Factory charge: 20 psig dry air - MUST BE EVACUATED										
Approved Evap. Range		Performance Data @ 90°F Ambient								
*F	PSIG	BTU/HR		Watts		Head		Evap. Oz./Hr.		
-10	23.9	1240		415		260		12.7		
0	32.8	1540		460		280		13.7		
10	43.3	1860		525		300		15.7		
20	55.5	2200		590		320		16.6		
30	69.5	2570		665		345		17.7		
45	94.3	3220		780		390		20.8		

20°F return gas temp. max. superheat above 20°F evap., 40°F max. below 20°F evap., 5°F subcooling.
Oz./Hr. is water evaporation rate at specific evap. temp., 70% relative humidity. BTU/HR is rated with dry pan.

Figure 6.4



ITEM: CONDENSING UNIT DETAIL
 PROJECT: DWG. 7002/
 DATE: 3-14-90 SCALE: N.T.S. DWN. BY: ND
 COSPOLICH
 REFRIGERATOR CO. INC. KENNER, LA. 70062

Figure 6.5

CHAPTER 7

PARTS LIST

7.1 *Introduction*

This section of the manual contains lists of replaceable parts. Each of the tables contain a list of removable parts associated with an assembly of the cabinet or refrigeration system. No parts identification has been provided for details of permanently assembled items or those items that are not suitable for field repair.

7.2 *Source Codes*

The sources for some items are shown in the part tabulation. Where no individual source code is listed, the part is available through **Cospolich Refrigerator Co., Inc., Kenner, LA 70062. (Fed. Mfg. Code #66682)**

TABLE 7.1 VENDOR SOURCE CODES

Code No.	Name	Address
14852	Bohn Heat Transfer	Danville, IL 61932
32761	Kason Industries	Shenandoah, GA 30265
50992	Ranco Control 5	St. Louis, MO 63143
78462	Sporlan Valve	St. Louis, MO 63143
14569	Copeland Corporation	Sidney, OH 45365-0669
17529	Watsco	Hialeah, FL 33010
59431	Tecumseh Products	Tecumseh, MI 49286
49048	Miljoco Corporation	Eastpointe, MI 48021
45020	Nashville Wire Products	Nashville, TN 37202-0491
79264	Jean's Extrusions, Inc.	Salem, IN 47167
2K223	Refrigeration Hardware	Sun Valley, CA 91353-1549
36462	Standard Keil, Inc.	Allenwood, NJ 08720
60886	Idec Corp.	Sunnyvale, CA 94089-2211
19220	Eberhard, Inc.	Cleveland, OH 44136-9712
66682	Cospolich Refrigerator Company, Inc.	Kenner, LA 70062

7-2: Parts List - Heating				
R-10-2M-SN				
Item	Cospart	Mfr	Vendor	Qty
Latch	HXLH06	172BC	Kason	1
Hinge	HXHE02	217	Kason	2
Thermometer	RWTM01C	20362002	Milijoco	1
Pilaster #1	HXSD01	65	Kason	4
Pilaster #2	-	-	-	-
Pilaster Clip	HXCS01	66	various	8
Shelves #1	SSW24BX16B	X	Nashville Wire	2
Shelves #2	-	-	-	-
Gasket #1	GB60V	X	Jean's Extrusions	1
Gasket #2	-	-	-	-
Mullion Heater #1	L1HR120	X	Springfield Wire	1
Mullion Heater #2	-	-	-	-
Breaker Kit #1	BB60V2	X	Cospolich	1
Breaker Kit #2	-	-	-	-
Light Switch	LRLS01	2767-1012-3000	various	1
Light Guard	LRLC01	2778-1010-3000	Standard Keil	1
Light Socket	LRSK01	L10-X003	Component Hdwr	1
Light Bulb	LRSB01	X	various	1
7-2:2 Parts List - Refrigeration				
R-10-2M-SN				
Item	Cospart	Mfr	Vendor	Qty
Evaporator Coil	RWE010	TA10AF	Bohn	1
Evaporator Motor	RWEM03	25300701	Bohn	1
Evaporator Fan	RWE5101B	5101B	Bohn	1
Expansion Valve	RWEV27	FS 1/4 C	Sporlan	1
Thermostat	RWTT08	A319ABC-24-01	Johnson Controls	1
Condensing Unit	RUT050	AEA9422ZXAXC	Tecumseh	1
Compressor	RUT051	AE590AT-900-P2	Tecumseh	1
Condenser	RWCD13	50823	Tecumseh	1
Condenser Fan Blade	RWFB17	51531-2	Tecumseh	1
Condenser Fan Motor	RWCM05	810M006B45	Tecumseh	1
Receiver	RWRT04	51080	Tecumseh	1
Start Capacitor	RWCP49	85PS165C27	Tecumseh	1
Run Capacitor	-	-	-	-
Relay	RWRLY09	820RR12B79	Tecumseh	1
Overload	RWOVL05	8300MRTE59	Tecumseh	1
Filter Dryer	RWFD02	C-052-S	Sporlan	1
Sight Glass	RWSG01	SG-114	Watsco	1
Pressure Control	RWPL02	1483	Ranco	1
Power Control Switch	LWTS01	G22-725	various	1
Terminal Box Assy	MT-001	X	EMF	1

**TABLE 7.2.3 PARTS LIST
SPECIAL TOOLS**

Part #	Description	Quantity
R1412	Refrigerant service gauges with hoses	1
VA70264	Valve Service Wrench	1
	Refrigerant	30 lbs.

CHAPTER 8

INSTALLATION

8.1 Unpacking

Note: Before unpacking unit, note any crating markings and check for damage to crating and notify the carrier if there should appear to be damage to the equipment.

The unit is shipped from the factory securely fastened to a single shipping pallet protected by an external wrapping

- a. Carefully remove all external wrappings and other protective coverings.
- b. Review the installation section of the manual completely before installation.
- c. Discard crating materials.

8.2 Installation

- a. Before moving the unit to the installation sight, double-check passageways to make certain that it will move through without modifications.

Note: In certain instances, it may be necessary to remove the doors and hardware to negotiate tight spaces.

- b. On most shipboard applications, a permanent base is fabricated by the ship builder to accommodate the base frame of the unit. *Once the cabinet has been attached to the ship's foundation, applying a silicone sealant around the complete perimeter at the point that the cabinet base contacts the foundation is necessary.*
- c. Position the unit to allow sufficient ventilation, usually leave a 3" clearance from adjacent bulkheads and other equipment. Try not to place the unit near heat producing items such as ovens, ranges, and furnaces.
- d. Level the cabinet from front to back and from side to side. This is important so that when securing to the deck base, the cabinet will not be pulled out of square.
- e. Evaporator coil drain lines are factory-installed and are tied into a condensate evaporator that eliminates the need for exterior plumbing. Check to make certain that the drain line is found inside the condensate evaporator pan. On units with remote refrigeration, the condensate evaporator pan is optional.

- f. Check the door gasket to make certain that they are sealing properly to the cabinet. Adjusting the latch strike inward to compensate for the compression of the gasket with age may be necessary.
- g. Before applying electrical power to the unit, you should first check the electrical characteristics of the condensing unit and make certain that they agree with those of the electrical supply source.

**CAUTION: LOW OR EXCESSIVE VOLTAGE CAN SEVERELY DAMAGE
THE ELECTRICAL SYSTEM.**

Note: Adjusting any valves or controls on the system is not necessary as this has been done at the factory.

CHAPTER 9

9.1 *Introduction*

This section of the manual contains drawings and schematics of the electrical and piping systems.

9.2 *Electrical Terminology and Abbreviations*

Definitions

RLA - Rated load amps

Rated load amps is a measure of the current drawn by a compressor when operated at compressor manufacturer rating conditions at nominal voltage. This value is listed at U.L. and C.S.A. as "RLA." It is in agreement with the N.E.C. definition that the RLA be the current draw when the compressor is delivering rated output.

LRA - Locked rotor amps

Locked rotor amps of a compressor is the current value recorded three seconds after rated voltage is applied under locked rotor conditions from a 75-degree F motor soakout temperature. (Voltage drop to be predetermined and adjusted accordingly before test.) This value appears on the compressor serial plate and on all compressor statistics sheets.

It may be well to note that the practice in the past was to show an additional column marked, LRA "U.L. Test Report." This is no longer needed, since the U.L. investigation work, regarding component rating, will be guided by the compressor manufacturer's published value.

MCG - Maximum continuous current

Maximum continuous current is a limiting ampere value that must not be greater than 156% of the rated load amps (RLA) of the compressor as marked on the nameplate of the particular unit into which that compressor is applied.

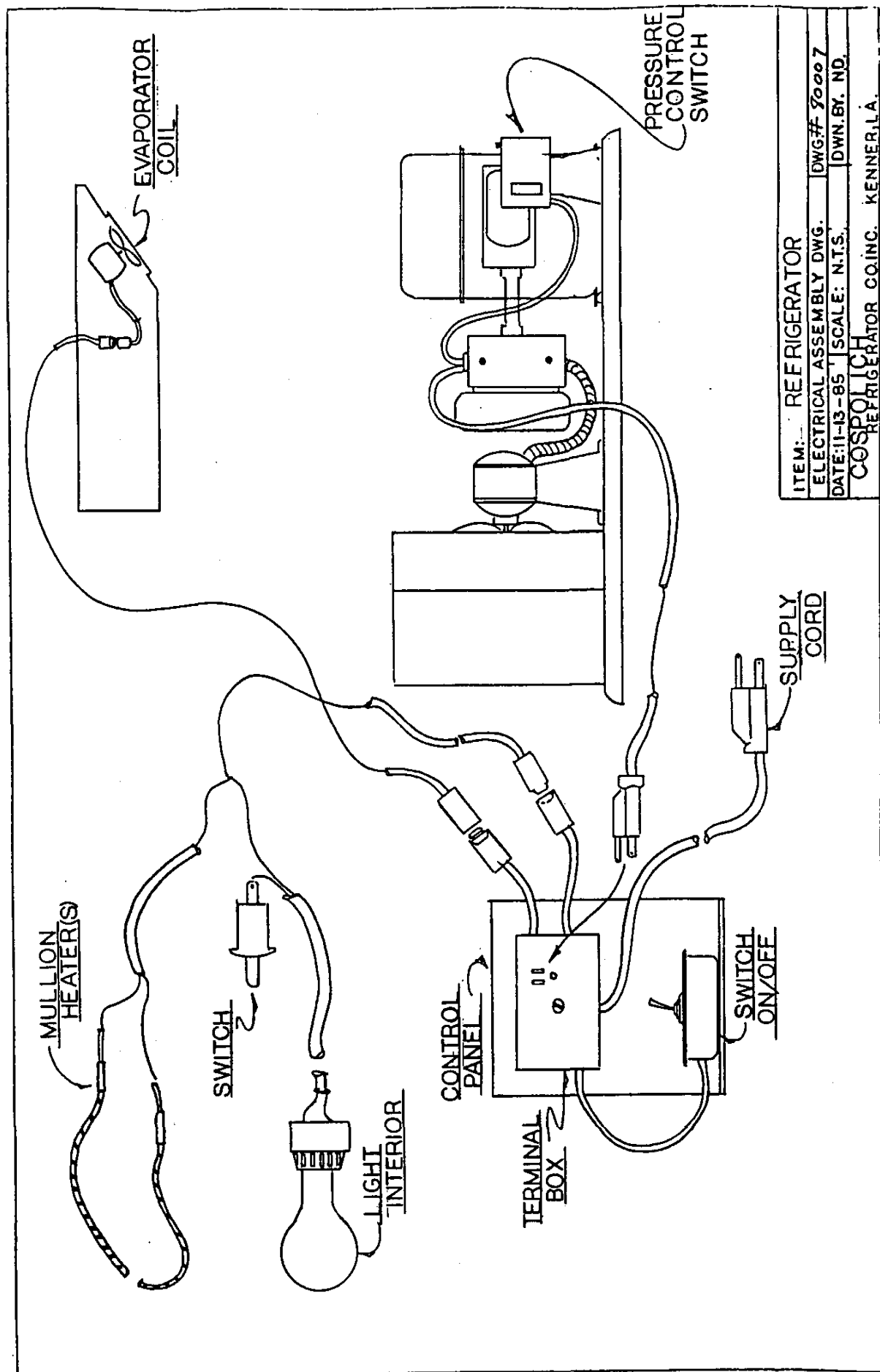


Figure 9.2

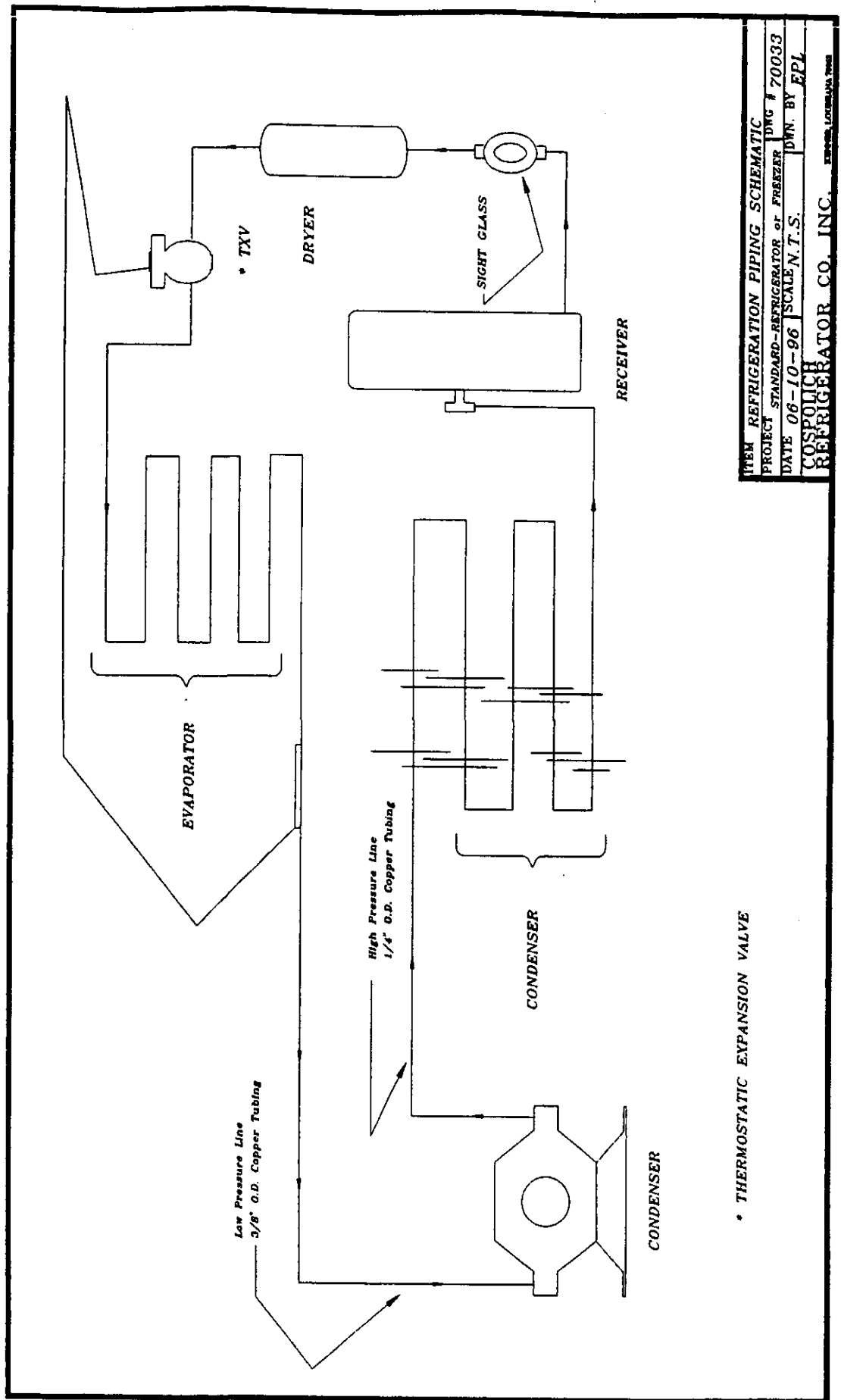


Figure 9.3

TABLE 9.1 OPERATING PRESSURES**R-12**

<i>Cabinet</i>	<i>Ambient</i>	<i>Suction Pressure</i>	<i>Head Pressure</i>
-5 Degrees F (Fre.)	90 Degrees F	0-10 lbs.	120-150 lbs.
37 Degrees F (Ref.)	90 Degrees F	18-35 lbs.	120-150 lbs.

R-22

<i>Cabinet</i>	<i>Ambient</i>	<i>Suction Pressure</i>	<i>Head Pressure</i>
- 5 Degrees F (Fre.)	90 Degrees F	10-15 lbs.	200-250 lbs.
37 Degrees F (Ref.)	90 Degrees F	37-67 lbs.	200-250 lbs.

134A

<i>Cabinet</i>	<i>Ambient</i>	<i>Suction Pressure</i>	<i>Head Pressure</i>
-5 Degrees (Fre.)	90 Degrees	-5-10 lbs.	120-150 lbs.
37 Degrees (Ref.)	90 Degrees	16-37 lbs.	120-150 lbs.

404A

<i>Cabinet</i>	<i>Ambient</i>	<i>Suction Pressure</i>	<i>Head Pressure</i>
-5 Degrees F (Fre.)	90 Degrees F	15-20 lbs.	250-300 lbs.
37 Degrees F (Ref.)	90 Degrees F	68-84 lbs.	250-300 lbs.

CHAPTER 10

LIMITED WARRANTY

Cospolich warrants their cabinets to consumers only against defects in material or workmanship under normal use and service for a period of one year from the date of shipment. We will repair or replace at our option, any part, assembly or portion thereof which **Cospolich's** examination discloses to be defective. **Cospolich** will pay the labor costs for the repair up to twelve (12) months from date of shipment.

Terms

Exclusions

Cospolich's obligations under this warranty shall not extend to any malfunction or other problem caused by unreasonable use, such as but not limited to, improper setting of controls, improper installation, improper voltage supply, loose electrical connections or blown fuses, and damage not attributable to a defect in workmanship. This warranty will not apply to any cabinet or component part that has been subject to any accident, alteration, abuse, misuse to any damage caused in fire, flood, or other acts of God and to any product serviced by an unauthorized service person or company.

To Secure Warranty Service

If you claim a defect under this warranty, direct your claim to whom you purchased the product, giving model, serial and code numbers with a description of the problem.

If the above procedure fails to satisfy your claim, you may write directly to the **Director of Customer Relations, Cospolich Refrigerator Co., Inc, 949 Industry Road, Kenner, La. 70062** listing the above.

There is no other express warranty on the **Cospolich** units except as stated herein. Any implied warrants of fitness and merchantability are limited in duration to the duration of this warranty. The liabilities of **Cospolich** are limited solely and exclusively to replacement as stated herein and do not include any liability for any incidental, consequential, or other damages of any kind whatsoever, whether any claim is based upon theories of contract negligence or tort. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion of limitations of incidental or consequential damages. So the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights that vary from state to state.